E/CONF.39/D/73
10 Oct.1962
ORIGINAL : ENGLISH

UNITED NATIONS CONFERENCE
ON THE APPLICATION OF SCIENCE AND TECHNOLOGY
FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

Agenda Item: D.7.1

Liberia

FACTORS IN SETTING UP AN IRON AND STEEL INDUSTRY IN LESS DEVELOPED AREAS

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FACTORS IN SETTING UP AN IRON AND STEEL INDUSTRY IN LESS DEVELOPED AREAS

BY

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1. INTRODUCTION

This paper is being written without particular reference to any underdeveloped country, but reflects my views as they relate to most, if not all, of the countries in underdeveloped areas.

The words "Iron and Steel" when they are involved in an industry has always been accepted as synonymous with progress other than those that are considered prosaic. What then are the basic factors involved in the creation of an iron and steel industry as they relate to the less developed areas of the world ?

For centuries now, iron and steel have formed part of man's existence and without same, it is almost impossible for him to live and progress along lines of modern and technical advancement. In most of the underdeveloped areas of the world, knowledge of technical know-how is one of the main drawbacks. Because of this dire lack of technical knowledge necessary to the discovery and utilization of natural resources, development in industrialization has lagged. Nevertheless, the demand for industrialization in these areas and an increasing desire to become more self-sufficient serve as motivating factors.

The availability of raw materials - iron, limestone, manganese, coke, gas and/or electrical energy etc., are primary requirements and those countries possessing these resources are in a better position to proceed with less difficulties towards creating iron and steel industries. However, this does not preclude the establishment of similar industries in countries with at least two of such raw materials, because other economic factors would better support and make it profitable to establish within the confines of the country its own steel industry.

Moreover, one cannot dismiss the economic factor implicit in determining the choice of methods used in producing the basic pig iron. Namely, scarcity of technical help, strategically located raw materials, and labour cost. The choice is made easier if prior consideration is given to incorporating related and unrelated secondary industries as well as the establishment of markets away from home.

Another factor that should be considered is the tendency of duplication of major and secondary industries in the less developed areas. I feel quite certain that a greater benefit would be derived in the less developed countries would take a natural resources

inventory and have conferences relative to economic and industrial developement and stagger different types of industrial developement, of which iron and steel is a part, so that less risk may be involved in the procurement of capital which is another major factor.

2. TECHNICAL KNOW-HOW

(a) The technological know-how is an inevitability and while it is true that in many less developed countries this might present a problem, it is equally true that similar problems have been solved in a relatively short time by on the job training under contractural foreign technicians as well as programs designed to send students abroad for higher studies and training. In recruiting foreign technical personnel it is important that the purpose and object of their services be made known. Not only as it relates to their training local help quickly and efficiently but individuals with a sympathetic understanding of the problems involved must be selected. There are very important requisites, for, unless the citizens in these less developed areas are trained to take over from their tutors in a reasonable period of time, a misconception could easily arise.

(b) Semi-skilled workmen can be recruited without difficulty in most underdeveloped areas and unskilled labourers can usually be found in abundance. The semi-skilled workmen, unlike those who must be trained to occupy the skilled or managerial positions, can be trained quickly; therefore, it must be clearly understood that those assigned to train them must not drag out the training programme to fit that of the professional or skilled workmen, which of necessity must take years.

3. RAW MATERIALS

It is unlikely that in any one country all the raw materials needed for the establishment of an iron and steel industry would be found. Therefore, the need frequently arises to supplement local need from foreign sources.

(a) From the knowledge of what goes into the establishment of an iron and steel industry, the ingredients are without exception bulky. Therefore, it is of prime importance that many of the raw materials required be produced locally and as cheaply as possible. The proximity of the source of raw materials to the plant site is most desirable. Iron ore, limestone and/or coal should be available locally, thus minimizing the need and cost of importation.

(b) On the question of importation of other basic raw materials, it goes without saying that this is essential if it cannot be produced locally. But here again, the nearest export market should be sought. The question of a preferential market, and in the light in which this might be viewed, could be a deterrent, especially where outside capital might tend to dictate choice. Nevertheless, this should not be strong enough to justify scrapping the project with other factors remaining favourable.

4. METHOD OF PRODUCTION

Iron and steel technology has progressed today to the place where there are several processes of reducing the ore to its metallic state. In years past, the blast furnaces were the backbone of the

steel industry, perhaps to many it still is. Today, any country, particularly the underdeveloped countries, desiring to embark upon this field must consider besides the blast furnaces other methods of production. Foreign technicians, when called upon to help, must realize that they must enter this endeavour with an entirely different perspective to that they would employ if they were called upon to establish a similar plant in Europe or North America. To many of them there exist problems and conditions that are quite foreign. Therefore, the desire for new techniques that will eliminate the demand for large quantities of raw materials not readily available, must be sought. Because of new techniques such as pelletization of low grade iron ore, birquetting, improved electrical furnaces, better recovery and upgrading of ore from washing plants, the feasibility of establishing an iron and steel industry becomes more attractive and desirable.

This paper does not discard any method of production, but have only stressed that a complete study of all available methods must be made before arriving at a decision. An example of what is meant - let us compare the blast furnace and the electric furnace which are to be used in the production of pig iron in a country possessing iron and coal and an abundance of hydro-electric potential. In the case of the blast furnace, consideration would have to be given to the erection of a coking plant while with the electric furnace, one has to consider the erection of hydro-electric power. Considering all other expenses to be fairly even in an expanding economy in the less developed areas, if where for some reasons the initial costs of the electric furnaces would cost more due to the erection of a hydro plant, but electric power must be had at any rate for domestic consumption and to enable the growth of secondary industry the choice should be for the later, thus minimizing the erection of other electrical power stations. Further, the waste gas from the electric furnace can be used to make fertilizers for agricultural purposes. That is, the reduction gas by the use of steam could be converted to a gas rich in hydrogen and by removing the carbon dioxide could be transformed to ammonia by using nitrogen from an air disintegration plant. The ammonia thus produced could be the basic material in the production of the above mentioned fertilizers.

5. SOCIO-ECONOMIC & POLITICAL CONSIDERATION

As the economy of a nation grows and becomes more complex, a wider choice of alternatives has to be considered. In principle, industrialization aims at finding the right combination of investment, technological and institutional changes and other measures which will produce the greatest economic results to the economic complex.

No single sector can be isolated from the entire economic complex if the greatest good is to be achieved. The analytical techniques employed must therefore incorporate the mechanism for choosing among various alternatives as well as a way of achieving consister results.

In underdeveloped areas, the significant use of available resources is an essential factor of primary economic consideration.

Industrialization is an expensive and complex undertaken involving enormous capital outlay and the use of various categories of labour - highly technical, skilled as well as semi-skilled and unskilled labour, must be available in large numbers to meet local demands of industries.

The major considerations therefore facing underdeveloped countries seeking to industrialize theri natural resources fall into two distinct categories, namely: the socio-Economic and the Political.

(a) Socio-Economic Implication - The first consideration involves the availability of capital and foreign exchange which are indeed scarce in most underdeveloped countries. Owing to the scarcity of capital and foreign exchange, most underdeveloped countries have had to make the alternative decision between inviting foreign investment through the granting of concession rights, or permitting their resources to remain dormant. This latter choice has given place to the view that the physical resources of a nation serve that nation and its people best when it can be converted into meaningful physical wealth capable of satisfying the social and economic needs and aspirations of that nation and its people. Evidently, this choice is motivated by national policy designed to increase national income, provide more employment opportunities, expand international trade and commerce with a view of creating a favourable balance of trade and distribute the wealth of the country more equitable among its people. Local capital should be encouraged to participate in the industrial growth of the country. Not only does this brings about a feeling of ownership, but the entire meaning of progress through the encumbent change that must follow will lead to a speedier overall developement programme. It must be pointed out here that collective association of the nature required to raise enough money to float the venture of the establishing of an iron and steel plant would be something strange to most people living in underdeveloped areas and it is left with local authorities to convince its citizens to participate by making certain guarantees that could not be made by foreign investors in the event this is a foreign undertaking with local participation.

(b) Political (i) (Local) - However, in order to achieve these broad objectives, a favourable political climate becomes a prerequisite, namely: stable government, favourable tax treatment, consistent economic policies, free enterprise system and the existence of a promising political complexion which minimizes the risk of possible nationalization; especially so, when the establishment of types of industries call for sizeable outlays, which in most instances must be foreign.

In addition to these, the convertibility of currency is also an essential factor which has both economic and political implications of some magnitude, but which deserves prior consideration within the context of this paper. In brief, except the investing country think in terms of the easy convertibility of the currency of the host country, into its own currency or some other acceptable currency, the prospects of investment becomes shrouded in clouds and unattractive.

(ii) Political (Regional) - One other factor of primary political consideration to underdeveloped countries tending towards industrialization is the need to avoid duplication of types of industries in areas enjoying close proximity.

A better view seems to favour close collaboration among underdeveloped countries to bring specialized types of industries capable of producing a variety of the economic needs of the region with emphasis on specialized industries rather than on duplication of these economic goods and services in too great a volume

to be economically advantageous to the region; especially in view of the present trend towards the formation of economic groupings among European Countries. i.e., An oil refinery in countries like Ghana, the Ivory Coast, and Liberia with contiguous boundaries is hardly advantageous to the West African region. But why in the first place an oil refinery in any of these countries rather than Nigeria with obvious advantages to all countries in the region ?

From an investment point of view, this would seem a more attractive prospect to investors. This point of view seems to be the answer to the European market and the E.E. community and provides a healthier environment for inter-regional trade amongst the countries and protection for the region's trade against exclusion from European markets.

With all these factors, technical know-how, raw materials, method of production, socio-economic and political taken into consideration and in their right perspective, the underdeveloped nations can industrialize at a faster pace since they have the advantage of abundant and untapped natural resources. Also the fact that many countries in North America and Europe are looking for markets to invest overseas. Finally, many costly experiments due to trial and error methods can be avoided.

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